

Detailed Restoration Plan: 4-6 Roads and Parking Lot Upgrades – Year 2 (EA # BNP-1232)

Phase 2 of the Secondary Roads and Parking Lot Upgrades project is continuing to upgrade existing infrastructure (paving, guardrails, curbs, culverts, etc.) and perform maintenance (rock scaling, ditch cleanout, sightline clearing, etc.) along 4-6 series roads and associated parking lots around Banff. Phase 2 sites include: Mt Norquay Scenic Drive, Lake Minnewanka Scenic Drive, Mountain Avenue, Vermillion Lakes Road, Upper Bankhead DUA parking lot, Minnewanka DUA parking lot (Vehicle and RV lots), Two Jack DUA Upper parking lot, and the Fenlands DUA parking lot. Since the work is spread out across a variety of unique locations, and construction details differ from site to site, restoration details are being prescribed on a site-by-site basis.

General Restoration Goals:

- <20% Bare soil (>80% Native vegetative cover)
- No new non-native vegetation species present post-disturbance
- No increase in non-native vegetation, as compared to pre-disturbance (similar plants/m²)

Project-wide Restoration Details

Soils

- Any soil excavation in vegetated areas should use a two-lift process; the first lift consists of organic matter (sod, litter, etc.) and topsoil, while the second lift contains subsoil. Topsoil must be stored separately from subsoil in such a way that they will not be admixed.
- Soil materials should be stored on a nearby hardened area during construction, not on top of adjacent vegetated areas.
- All topsoil imports are subject to third-party testing as prescribed by a Parks Canada Vegetation Specialist, based on the origin of soil to be imported, as detailed in the Vegetation Removal and Restoration/Reclamation Guidelines for the Banff Field Unit (Draft). This process may take more than 3 weeks to coordinate; the project is responsible for all logistics and associated costs.
- If soil compaction occurs prior to planting, topsoil must be loosened to depth of 200mm (or to the maximum topsoil depth, if less than 200mm) at the time of seeding.
- Final seedbed should be rough and undulating; “rough and loose”.
- No topsoil or vegetated areas should be compacted unnecessarily (ex. by driving over repeatedly). Keep vehicles/machinery on hardened surfaces as much as possible.
- Machinery/vehicles should take care not to drive off hardened surfaces during wet conditions to reduce the chance of creating ruts. All incidental rutting should be reported to a Parks Canada Vegetation Specialist who will prescribe restoration methods. The project will be responsible for restoring the ruts, as prescribed.

Seeding

- The project is responsible for sourcing and purchasing prescribed seed mixes. Seed certificates MUST be verified and approved by a Parks Canada Vegetation Specialist PRIOR to seed being purchased; do not purchase seed without written approval.
- Fertilizer and/or seed coating (including ultra-coating) is NOT permitted for use on this project.

- If there is seed left over from year 1 of this project (seed purchased using the process described above), it may be used up during year 2 at the appropriate seeding rate and method prescribed for this phase.
- Construction should be scheduled so that seeding can coincide with seasonal planting windows (i.e., periods of time when seeding is most likely to result in successful plant germination and growth). Rough seasonal planting windows are outlined below, but seasonal variability must be accounted for.
 - Spring: April-June: No snow cover; ensure machinery does not compact/rut soils.
 - Summer: July-September: Do not seed; conditions not suitable for germination.
 - Fall: Late September to early November; until snow cover/ground freezes.
- Individual sites should be seeded as soon as they are brought to final contour; do not delay seeding until all areas of the project are brought under final contour.

Non-Native Vegetation and Debris Management

- All sites have existing non-native vegetation infestations; all equipment and tools must be washed thoroughly prior to being moved to a new location.
- All work sites within this project are to be pre-controlled for non-native vegetation prior to construction. Pre-control by herbicide application must be coordinated by the Parks Canada Vegetation Specialist and paid for by the project. This is not the responsibility of the contractor.
 - * There should be a delay between herbicide application and ground disturbance; follow the product label recommendations with respect to this delay (approximately 7 days, based on Milestone herbicide).
- Herbicide application is to be completed in the spring of the construction year for spring construction sites and in the spring and early fall of the construction year for fall construction sites and staging areas (Cascade Pit).
- All identified trees are to be hand-felled by a qualified individual and according to the Vegetation Removal and Restoration/Reclamation Guidelines for the Banff Field Unit (Draft).
- Removal of mature Douglas-fir trees (*Pseudotsuga menziesii* (Mirb.) Franco) should be avoided.
- All vegetative debris generated by the project will be disposed of outside the park, except logs greater than 15cm in diameter, which may be given to Parks Canada for re-purposing (firewood, etc.). No other debris management options (piling and burning, mulching, etc.) have been approved for this project; any change from removing debris will require approval from a Parks Canada Vegetation Specialist on a site-by-site basis.

Site-Specific Restoration Details

A summary of site-specific restoration details is provided in Table 1, while complete details for each site can be found in the pages that follow.

Table 2. Summary of site-specific restoration details.

Year	Site	Page #	Tree/Veg Removal?	NNV pre-control?	Topsoil import?	Seeding Method	Seeding Rate
2018	Mt Norquay Scenic Drive	3	Yes	Yes	-	Broadcast + hydro mulch	50 kg/ha
	Lake Minnewanka Scenic Drive	4	Yes	Yes	TBD	Broadcast + hydro mulch	50 kg/ha
	Mountain Avenue	5	Yes	Yes	-	Broadcast + hydro mulch	50 kg/ha
	Vermillion Lakes Road*	6	Yes	Yes	-	Broadcast + hydro mulch	50 kg/ha
	Upper Bankhead DUA Parking Lot	7	Yes	Yes	Maybe	Broadcast	50 kg/ha
	Minnewanka DUA Parking Lots	8	-	-	-	-	-
	Two Jack DUA Upper Parking Lot	9	-	Yes	-	Broadcast	50 kg/ha
	Fenlands DUA Parking Lot	10	-	Yes	-	Broadcast	50 kg/ha

*uses different seed mix than other sites (Riparian mix)

Location: Mt Norquay Scenic Drive

Tree/Vegetation Removal

Tree/Veg removal?	Yes
Details:	Minor clearing and grubbing work where vegetation is within the footprint of the road subgrade repairs and ditch cleanout. Additional vegetation removal may be required as part of retaining wall construction (site visits indicate retaining walls will not affect any live Douglas-fir trees).

Non-Native Vegetation (NNV) Concerns

Existing NNV?	Yes
Details:	Canada thistle, Nodding thistle, Annual sow thistle, Tall buttercup in area

Herbicide application to pre-control the thistle infestations along entire extent of the road should be completed in the spring of 2018 (prior to soil disturbance, while the plants are in the rosette and bolt phases) to prevent further establishment in disturbed areas created by grubbing/ditch cleanout. If work continues in the fall, an early-fall herbicide application will also be required.

Soil

Soil disturbance?	Yes
Details:	Ditch cleanout work along the majority of uphill shoulders to re-establish ditch lines; rock scaling
Topsoil import?	No
Details:	n/a

Surface litter and topsoil should be salvaged during ditch cleanout so it can be used for site reclamation in areas that will be re-seeded with grass (especially around retaining wall work). Surface litter and topsoil can be combined for storage, but should not be admixed with subsoil. Topsoil replacement and seeding will only be required in areas where it existed pre-construction, at the discretion of the departmental representative.

Seeding

Seeding Method:	Broadcast seeding with hydromulch on top		
Seeding Rate:	50kg/ha		
Seed mix:	Adjusted "Mix #4 Non-attractant Hwy/Rwy"		
	<u>Percentage</u>	<u>Species</u>	
	56%	Smooth wild rye	<i>Elymus glaucus</i>
	22%	Rough hair grass	<i>Agrostis scabra</i>
	10%	Spike trisetum	<i>Trisetum spicatum</i>
	6%	June grass	<i>Koeleria macrantha</i>
	6%	Alpine bluegrass	<i>Poa alpina</i>

All bare topsoil should be seeded as soon as possible post-construction with the above method, rate, and seed mix. Seeding should not wait for all areas of a project to be brought under final contour; seeding should occur on each area as it is completed, so as to not leave topsoil bare for prolonged periods.

Location: Lake Minnewanka Scenic Drive

Tree/Vegetation Removal

Tree/Veg removal?	No
Details:	n/a

Non-Native Vegetation (NNV) Concerns

Existing NNV?	Yes, at multiple locations around the loop
Details:	Yellow toadflax, Spotted knapweed, Orange hawkweed, Meadow hawkweed, Black henbane, Blueweed, Tall buttercup, Canada thistle, Bluebur, Bull thistle, Oxeye daisy

Herbicide application to pre-control any work locations where vegetation and/or soil is being disturbed, and any staging areas along the Minnewanka loop should be completed in the spring and fall of 2018 to prevent further weed establishment in disturbed areas created by work.

Soil

Soil disturbance?	Yes
Details:	Rehabilitation of the slope failure on the southern leg of the scenic drive.
Topsoil import?	TBD for slope failure area
Details:	TBD for slope failure area

Seeding

Seeding Method:	Broadcast seeding with hydromulch on top		
Seeding Rate:	50kg/ha		
Seed mix:	Adjusted "Mix #4 Non-attractant Hwy/Rwy"		
	<u>Percentage</u>	<u>Species</u>	
	56%	Smooth wild rye	<i>Elymus glaucus</i>
	22%	Rough hair grass	<i>Agrostis scabra</i>
	10%	Spike trisetum	<i>Trisetum spicatum</i>
	6%	June grass	<i>Koeleria macrantha</i>
	6%	Alpine bluegrass	<i>Poa alpina</i>

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****Additional details needed for re-vegetating the slope failure area after it is stabilized; the design for this portion is not yet completed, and it will be going to tender at a later date. This reclamation plan will be updated to reflect these details when they are provided.**

Location: Mountain Avenue

Tree/Vegetation Removal

Tree/Veg removal?	Yes
Details:	Tree and vegetation removal along roadway uphill of and behind bus stop area to create a new drainage ditch and clearing/grubbing work in ditches. (species include: lodgepole pine, subalpine fir, juniper and shepherdia)

Logs with diameters of 15cm or greater may be offered to campgrounds for firewood (coordinate with Parks Canada representative to arrange).

Non-Native Vegetation (NNV) Concerns

Existing NNV?	Yes
Details:	Upper hotspots parking lot area – Yellow toadflax, Scentless chamomile, Canada thistle, Common burdock, Meadow hawkweed Along road just N of Middle Springs – Tall buttercup

Herbicide application to pre-control non-native vegetation should be completed in the spring and fall of 2018 to prevent further establishment in disturbed areas created by grubbing work, ditch cleanout/creation, and culvert installations.

Soil

Soil disturbance?	Yes
Details:	Clearing/grubbing, ditch cleanout, localized excavation to re-direct surface flows below Mountain Ave west of Middle Springs Drive
Topsoil import?	No
Details:	n/a

Topsoil and surface litter should be salvaged during the ditch construction west of Middle Springs Drive; this topsoil may be re-used at the same location.

Seeding/Planting

Seeding Method:	Broadcast seeding with hydromulch on top		
Seeding Rate:	50kg/ha		
Seed mix:	Adjusted "Mix #4 Non-attractant Hwy/Rwy"		
	<u>Percentage</u>	<u>Species</u>	
	56%	Smooth wild rye	<i>Elymus glaucus</i>
	22%	Rough hair grass	<i>Agrostis scabra</i>
	10%	Spike trisetum	<i>Trisetum spicatum</i>
	6%	June grass	<i>Koeleria macrantha</i>
	6%	Alpine bluegrass	<i>Poa alpina</i>

All bare topsoil should be seeded as soon as possible post-construction with the above method, rate, and seed mix. Seeding should not wait for all areas of a project to be brought under final contour; seeding should occur on each area as it is completed, so as to not leave topsoil bare for prolonged periods. Using riprap in the bottom of the drainage ditch as a permanent erosion control is acceptable.

****Details regarding the new drainage ditch may change. This portion of the plan will be updated to reflect final decisions.**

Location: Vermillion Lakes Road

Tree/Vegetation Removal

Tree/Veg removal?	Yes
Details:	Vegetation removal associated with culvert installation.

Non-Native Vegetation (NNV) Concerns

Existing NNV?	Yes
Details:	Canada thistle along entire road, localised patches of Tall buttercup

Herbicide application to pre-control the Canada thistle and Tall buttercup infestations along the entire road should be completed in the spring and fall of 2018 to prevent further establishment in disturbed areas. Care should be taken to follow all herbicide application restrictions for application near water, as outlined in the herbicide label.

Soil

Soil disturbance?	Yes
Details:	Culvert installations, Drainage excavation
Topsoil import?	No
Details:	n/a

Topsoil is to be salvaged during on-site work and reused as needed. If there is excess topsoil, it must be disposed of outside the park because of weed contamination.

Seeding/Planting

Seeding Method:	Broadcast seeding with hydromulch on top		
Seeding Rate:	50kg/ha		
Seed mix:	Adjusted "Riparian Mix"		
	<u>Percentage</u>	<u>Species</u>	
	15%	Hairy wild rye	<i>Elymus innovatus</i>
	15%	Awned wheatgrass	<i>Agropyron trachycaulum var. unilaterale</i>
	14%	Tufted hair grass	<i>Deschampsia caespitosa</i>
	11%	Fringed brome	<i>Bromus ciliatus</i>
	11%	Northern wheatgrass	<i>Agropyron dasystachyum</i>
	11%	June grass	<i>Koeleria macrantha</i>
	9%	Fowl bluegrass	<i>Poa palustris</i>
	8%	Alpine bluegrass	<i>Poa alpina</i>
	6%	Spike trisetum	<i>Trisetum spicatum</i>

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Location: Upper Bankhead DUA Parking Lot

Tree/Vegetation Removal

Tree/Veg removal?	Yes
Details:	Some vegetation and possibly tree removal required at the surface drainage outflow. This will be from the edge of the parking lot near the west side of the access road, leading towards an identified low-lying area.

Non-Native Vegetation (NNV) Concerns

Existing NNV?	Yes
Details:	Canada thistle, Tall buttercup

Herbicide application to pre-control the Canada thistle and Tall buttercup in vegetation islands and around the perimeter of the Day Use Area should be completed in the spring of 2018 to prevent further establishment in disturbed areas. Herbicide application will not be required in the parking lot island if the end-product will not be vegetated (concrete pad).

Soil

Soil disturbance?	Yes
Details:	Constructing a sidewalk on parking lot island. Replacement of existing concrete curbs and gutter around the parking lot island and the DUA access road.
Topsoil import?	No
Details:	n/a

Topsoil removed from the parking lot island, if not re-used in the island itself, must be disposed of outside of the park due to weed contamination.

Seeding

Seeding Method:	Broadcast seeding		
Seeding Rate:	50kg/ha		
Seed mix:	Adjusted "Mix #4 Non-attractant Hwy/Rwy"		
	<u>Percentage</u>	<u>Species</u>	
	56%	Smooth wild rye	<i>Elymus glaucus</i>
	22%	Rough hair grass	<i>Agrostis scabra</i>
	10%	Spike trisetum	<i>Trisetum spicatum</i>
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Location: Minnewanka DUA Parking Lots (Vehicle & RV Lots)

Tree/Vegetation Removal

Tree/Veg removal?	No
Details:	n/a

Non-Native Vegetation (NNV) Concerns

Existing NNV?	Yes
Details:	Canada thistle, Yellow toadflax

No pre-control will be required as long as no soil disturbance will occur on this site. No equipment will be permitted to drive off of hardened surfaces.

Soil

Soil disturbance?	No
Details:	n/a
Topsoil import?	No
Details:	n/a

Seeding

No seeding will be required since no soil will be disturbed.

Location: Two Jack DUA Upper Parking Lot

Tree/Vegetation Removal

Tree/Veg removal?	No
Details:	n/a

Non-Native Vegetation (NNV) Concerns

Existing NNV?	Yes
Details:	Canada thistle, Tall buttercup

Herbicide application to pre-control the Canada thistle and Tall buttercup in vegetation islands and around the perimeter of the Day Use Area should be completed in the spring and fall of 2018 to prevent further establishment in disturbed areas.

Soil

Soil disturbance?	Maybe around parking lot edges
Details:	Grading and compaction of the existing granular surface, asphalt surfacing
Topsoil import?	No
Details:	n/a

Seeding

Seeding Method:	Broadcast seeding		
Seeding Rate:	50kg/ha		
Seed mix:	Adjusted "Mix #4 Non-attractant Hwy/Rwy"		
	<u>Percentage</u>	<u>Species</u>	
	56%	Smooth wild rye	<i>Elymus glaucus</i>
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Location: Fenlands DUA Parking Lot

Tree/Vegetation Removal

Tree/Veg removal?	No
Details:	n/a

Non-Native Vegetation (NNV) Concerns

Existing NNV?	Yes
Details:	Canada thistle, Tall buttercup

Herbicide application to pre-control the Canada thistle and Tall buttercup in vegetation islands and around the perimeter of the Day Use Area should be completed in the spring of 2018 (prior to soil disturbance, while the plants are in the rosette and bolt phases) to prevent further establishment in disturbed areas.

Soil

Soil disturbance?	Maybe around parking lot edges
Details:	Grading and compaction of the existing granular surface, asphalt surfacing
Topsoil import?	No
Details:	n/a

Seeding

Seeding Method:	Broadcast seeding		
Seeding Rate:	50kg/ha		
Seed mix:	Adjusted "Mix #4 Non-attractant Hwy/Rwy"		
	<u>Percentage</u>	<u>Species</u>	
	56%	Smooth wild rye	<i>Elymus glaucus</i>
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